Notes from the Sarawak Museum.

BY R. SHELFORD.

ON THE OCCURRENCE OF THE MIMETIC LOCUSTID *Condylodera tricondyloides* (WEST.) IN BORNEO.

This locustid which most closely mimics a large blue tiger-beetle, *Tricondyla sp.*, was originally discovered in Java and was described by Westwood in the Transactions of the Linnean Society, Vol. xviii, p. 409. The insect had so entirely deceived this renowned entomologist that it had been placed in the Hope collection of tiger-beetles *(Cicindelidæ)*, the mistake not being discovered for some time; subsequently another example was taken, in Java again, and was actually given the MS. name of *Tricondyla rufipes* by Duponchal. This specimen is also in the Hope collection, University Museum, Oxford. In Feb. 1900, my Dyak collectors brought in a locust which I immediately suspected to be the same species as that occuring in Java, and Dr. E. B. Poulton, F.R.S., to whom I have sent the specimen, informs me that if not the same species it is very closely allied; it is somewhat larger than the type. As the insect is undoubtedly very rare the following brief description of the colouration and external characters of a newly-killed example may be of some interest. The general colour is a dark blue of a shade identical with that of the *Tricondyla*; all the femora are bright red, the tibiæ and tarsi brown, again as in the model; the antennæ are long (two and one-half to three times the length of the body), and of an extreme tenuity and fragility: the head is extremely Cicindelid in form, with its prominent eyes and large mouth parts: the pronotum is elongate, somewhat constricted anteriorly and about its middle, the whole corresponding in length and shape to the prothorax and narrowed anterior third of the elytra of the tiger-beetle; the wing-rudiments are closely adpresed to the body and so do not break its smooth outline; the abdomen is slightly swollen; in the tiger-beetle the prothorax is smooth, the elytra strongly punctured, whilst in its mimic the pronotum is strongly punctured and the nervuration of the wing-rudiments gives also an impression of punctures. The locust seems to frequent old jungle and one example was found running about amongst dead and decaying vegetation, a situation in which the model is frequently met with. As might be expected from the comparatively small size of the hind femora the insect possesses but feeble leaping powers, appearing to trust rather to its turn of speed as a runner. Whether this is the adult stage or not is uncertain; the presence of wings would seemingly detract from the marvellously close mimicry, and one is inclined to suspect that they have secondarily become atrophied. In July another specimen differing in no wise from that just described was obtained, and also a very young example. This last was most interesting, since at this stage both body and legs were entirely dark blue and constituted a close mimic of a very small tiger-beetle of the genus *Collyris*, a flower-haunting species; the young locust was taken on the blossoms of a flowering tree, so that not only in colour but also in habits it differed markedly from the adult. Bearing in mind the mistakes made over this insect by such distinguished entomologists as Westwood and Duponchal. I made a careful search through our collection of Cicindelidæ, and was delighted to find in it yet another specimen of this very deceptive locust: this was intermediate in size between the youngest and the oldest stage known and mimicked another species of tiger-beetle (? Collyris sp.). Except in the matter of size there was little difference between this stage and the oldest stage, and I have naturally nothing to record of its habits.

I am unaware of any other example in the insect world affording a parallel case of mimicry: it is the general rule that a mimetic insect is mimetic at only one stage of its life history, or if at more than one, the models for the different stages are different; e.g., the larva of the hawk-moth Chaerocampa aurata, is remarkably snake-like, but the pupa is buried and the imago is protectively coloured; or again—the Mantis, Hymenopus bicornis is, when adult or when half-grown, a floral simulator, but the newly-hatched young mimic the newly-hatched young of an extremely common and highly distasteful bug, *Eulyes amœna*. The *Condylodera*, however, at all stages of its life history, so far as they are at present known, mimics a tiger-beetle; the models are, it is true, of different species, but a moment's reflection will shew that this is a necessity, for the young stages of an ametabolic insect such as this locust cannot mimic the corresponding stages (larva and pupa) of a holometabolic insect, such as the Tricondyla, which when adult serves as a model to the adult locust, without undergoing a series of modifications of structure that would completely alter the nature of the insect,—in short, the locust would no longer be a locust. The difficulty is obviated by the mimicking of different species of beetles, the model in each case corresponding in size to the mimic. It would be a matter of the greatest interest to discover the life histories of the Philippine grasshoppers *Scepastus pachyrhynchoides* and *Phoraspis sp.* which in their adult stages mimic respectively a weevil and a ladybird, sa these might afford parallel examples to the life history of Condylodera.

ON A COLOUR VARIETY OF *Coluber Oxycephalus* (BOIE).

This well-known snake is usually brilliant blue-green in colour, the tail alone being brown, but recently I obtained amongst sandy scrub fringing high-water mark near the mouth of the Trusan River an example with the head and body bright ochreous and the tail pale brown. Coloured in this manner the snake was, considering its size, very inconspicuous against its sandy background and it undoubtedly presented an example of adaptation to the colour of its surroundings such as may be met with in every desert area. The snake was preserved in formol and when examined next day was still quite ochreous. Three days later, however, the colour had reverted to the familiar blue-green; the preservative fluid was not discoloured so that the change must have been brought about, not by a dissolving out of pigment, but by some alteration of the shape or size of the pigment cells or chromatophores.

Mr. H. N. Ridley described in this Journal (No. 31, p. 89) an interesting colour variety of another species of this genus, *Coluber tœniurus* (Cope), from the Selangor caves; this variety was also protectively coloured but in adaptation to very different surroundings from those of the *C. oxycephalus* variety just described.